MONTHLY WEATHER REVIEW.

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INTRODUCTION.

The present summary for 1901 is based essentially upon data received from about 162 regular stations, 33 regular Canadian stations, and such voluntary stations as have forwarded their annual summaries in time. The statistical tables and charts have been prepared under the supervision of Prof. A. J. Henry, Chief of the Division of Meteorological Records; the tables of movements of high and low areas by Mr. George E. Hunt, Chief Clerk, Forecast Division; and the summary of flood movements by Dr. H. C. Frankenfield, Forecast Official.

FORECAST DIVISION.

Prof. E. B. GARRIOTT, in charge.

HIGHS AND LOWS OF 1901.

The high and low data for the year 1901 have been compiled under the general plan in use since 1895, and they differed but slightly in their general features from those of the preceding six years.

The tables herewith give the summary for each month of the year 1901, and likewise a summary for the seven years from 1895 to 1901, inclusive.

Summary of highs and lows for 1901.

Month.	Highs.							Lows.						
	Mean first observed.		Mean last observed.		Path, average.		Hourly velocity.	Mean first observed.		Mean last observed.		Path, average.		Hourly velocity.
	Lat. N.	Long. W.	Lat. N.	Long. W.	Length.	Duration, days.		Lat. N.	Long. W.	Lat. N	Long. W.	Length.	Duration, days.	
	°	°	°	°	*Miles.*			°	°	°	°	*Miles.*		
Jan.....	44	108	40	76	1,918	2.4	33.5	43	110	45	70	2,789	4.0	33.1
Febr....	46	108	39	79	1,173	2.5	28.8	41	111	40	78	2,222	3.2	31.7
Mar.....	39	101	38	72	1,989	3.1	26.6	40	105	40	73	2,343	4.4	26.4
Apr.....	42	116	41	85	1,933	2.8	28.7	41	109	43	85	1,973	3.1	26.7
May....	38	112	41	81	2,362	4.4	22.0	43	95	44	70	1,656	3.0	23.1
June....	50	111	41	70	2,425	4.1	25.5	41	100	44	79	1,532	2.8	24.1
July.....	49	106	38	74	2,276	3.8	25.1	39	95	41	74	2,043	3.8	22.1
Aug.	51	108	46	66	2,495	4.1	25.1	38	102	46	74	2,133	4.1	26.2
Sept....	52	119	42	66	3,160	4.5	29.0	38	104	46	70	2,622	4.4	25.9
Oct.	50	112	41	74	2,384	3.6	29.7	45	108	48	73	2,036	3.1	28.4
Nov	48	107	39	80	1,866	3.0	25.7	47	116	43	64	2,461	3.7	28.6
Dec.....	46	114	42	77	2,846	4.2	31.1	43	108	46	74	2,464	3.1	36.2
Means..	48	112	41	75	2,229	3.5	27.6	42	105	44	74	2,190	3.6	27.8

Summary, 1895 *to* 1901, *inclusive.*

Year.	Highs.					Lows.				
	Mean first observed.		Mean last observed.		Hourly velocity.	Mean first observed.		Mean last observed.		Hourly velocity.
	Lat. N.	Long. W.	Lat. N.	Long. W.		Lat. N.	Long. W.	Lat. N.	Long. W.	
	°	°	°	°	*Miles*	°	°	°	°	*Miles*
1895.....	47	110	39	80	24	45	107	45	73	26
1896.....	48	111	42	75	24	46	111	46	74	26
1897.....	48	113	38	78	24	46	110	46	71	26
1898.....	46	114	40	72	25	45	111	46	67	26
1899.....	47	114	41	72	24	44	111	46	68	27
1900.....	46	108	42	75	28	44	106	45	73	30
1901.....	48	112	41	75	28	42	105	44	74	28
Mean...	47	112	40	75	25	44	109	45	71	27

Geo. E. Hunt, Chief Clerk Forecast Division.

RIVER AND FLOOD SERVICE.

During the year Macon, Ga., was established as a river center for the territory comprising the Oconee and Ocmulgee watersheds, which were formerly a part of the Atlanta district; the Washington, D. C., district was enlarged by the addition of the territory east of the Allegheny Mountains which formerly belonged to the Parkersburg, W. Va., district. There were added to the River and Flood Service 11 special river stations, and one special rainfall and three special river stations were discontinued. The stations established were at Booth, Tex., Galveston district; Clarion and Saltsburg, Pa.,

Pittsburg district; Cumberland, Md., and Riverton, Va., Washington district; Frankfort and Highbridge, Ky., Louisville district; Camden on Gauley, W. Va., Williamson, W. Va., and Warfield, Ky., Cincinnati district; and New Madrid, Mo., Memphis district. Those closed were the special river stations at Arlington, Mo., St. Louis district; Philippi, W. Va., Pittsburg district; Lock No. 4 (Lincoln), Ala., Montgomery district; and the special rainfall station at Cumberland, Md., Washington district.

Thirteen new river gages were installed and a large number of others thoroughly repaired.

The service has not only maintained its previous high reputation for efficiency, but has still further added to it. As an evidence of this it is only necessary to refer to the steady increase in the number of requests for the benefits of the River and Flood Service.

While there were no really great floods during the year, there were several of somewhat decided proportions, particularly those of the Ohio River in April, the upper Tennessee in May and the rivers of the Atlantic States in December. Accounts in detail of these and other floods will be found in the MONTHLY WEATHER REVIEW for the appropriate months.

The highest and lowest river stages for the year, together with the mean stage and annual range. at 134 selected stations are given in Table VIII.—*H. C. Frankenfield, Forecast Official.*

GENERAL CLIMATIC CONDITIONS.

By ALFRED J. HENRY, Professor of Meteorology.

ATMOSPHERIC PRESSURE.

The numerical values of annual mean pressures for 1901 are given in Tables I and II. The method of reduction to sea level in use during the year was the same as in former years, with the exception that an appropriate correction for variations in the force of gravity with latitude has been applied since January 1, 1899. In other respects the annual mean values are comparable with those of the preceding and other years in which Professor Hazen's method of reduction was used.

In addition to the table of reduced pressures, referred to in the preceding paragraph, a second table has been formed (Table III), in conformity with the custom of previous years, by reducing the actual pressures to sea level and standard gravity in accordance with the tables and methods of the International Meteorological Committee, as explained in the MONTHLY WEATHER REVIEW for 1895, Volume XXIII, pages 492–494. The reduced pressures so obtained appear in Table III and on Chart I. The data in the last column of Table III are the pressures at 10,000 feet above sea level, obtained by assuming a uniform decrement of temperature at the rate of 2° F. per 1,000 feet (0.37° C. per 100 meters), as in former annual summaries; the resulting isobars are shown on Chart II.

The distribution of mean pressure at sea level for 1901 is shown by the isobars on Chart I.

The configuration of the isobars for 1901 differs very slightly from that of 1900. Pressure was below normal over the eastern part of the country by amounts ranging from .02 to .05 inch; it was also below the normal in the Rocky Mountain region by amounts ranging from .01 to.08 inch. In the upper and middle Mississippi Valley and on the Pacific coast it was normal or slightly above.

TEMPERATURE.

The distribution of mean surface temperature is shown on Chart III, and the district departures by Table A.

Mean temperature was above the average in all parts of the country, except the South Atlantic and east Gulf States, the Ohio Valley, and Tennessee. The excess ranged from a fraction of a degree on the Pacific coast and in the Southwest to about 4° over the northeastern Rocky Mountain slope and Manitoba. Maximum temperatures of 110° and over were registered in southern Illinois, northern Arkansas, Missouri, southern Iowa, eastern Kansas, Oklahoma, eastern Montana, and South Dakota. Maximum temperatures of 110° were also registered in the Great Valley of California and in the desert region of northwestern Utah. The minimum temperatures of the year were not greatly different from those of the preceding year. Temperature fell to 40° below zero and lower in eastern Wyoming, southwestern South Dakota and northwestern Nebraska. The maximum, minimum, and mean surface temperatures are graphically shown on Chart III.

PRECIPITATION.

The distribution of annual precipitation is shown on Chart IV and the district departures by Table B. The year, as a whole, was marked by large local variations. It was unusually dry in the Ohio Valley, portions of the lower Lake region, and the Mississppi Valley south of Iowa. On the eastern Florida coast there was an excess of 18 inches at Jupiter and on the western coast a deficit of 10 inches at Tampa. The precipitation at Charleston, S. C., was 24 inches below the normal, and at Charlotte, N. C., 11 inches above the normal. There was an excess of rain in the upper Missouri Valley and also in the southern slope region. Rainfall was deficient on the Pacific coast and over practically all of the Plateau region.

THUNDERSTORMS.

The frequency of thunderstorm days in the different months and in the several States and Territories is shown approximately by the figures of Tables V and VI. The first-named table has been prepared from reports of both regular and voluntary observers with a view to showing the number of thunderstorm days recorded each month in the immediate neighborhood of the respective stations. The second table shows the number of days on which thunderstorms were recorded in the State or Territory as a whole. In preparing the last-named table reports from all stations whatsoever were used. The number of thunderstorm days for a given State, as shown in Table VI, depends largely upon the size of the State and the number and distribution of observing stations. In the District of Columbia, for example, with but one station, the number of thunderstorm days was 37, while for the adjacent State of Maryland, with an average of 58 stations, thunderstorms were observed on 123 days. In Virginia, with about 54 stations, the number of thunderstorm days was 130. The number of thunderstorms observed at a single station bears a fairly definite relation to the number that would be observed were it possible to greatly enlarge the field of observation. The ratio for Washington, D. C., is about 3.5, that is to say, in order to ascertain the number of thunderstorm days for a region equal in area to the adjoining States of Maryland and Virginia we have only to multiply the number observed at Washington by the constant 3.5.

Thunderstorms were reported on a greater number of days in 1901 than in 1900 in southern New England, the upper Ohio Valley, and the eastern portion of the Middle Atlantic States, also on the Pacific coast south of Washington, the southern Plateau and in the Southwest; elsewhere, the number reported during 1901 was considerably less than in the preceding year.